Nuytsia The journal of the Western Australian Herbarium

30: 25–31 Published online 28 March 2019

SHORT COMMUNICATION

Eremophila oldfieldii subsp. *papula*, *E. sericea* and *E. xantholaema* (Scrophulariaceae), three new taxa from Western Australia

Eremophila oldfieldii F.Muell. subsp. **papula** A.P.Br., *subsp. nov.*

Type: Karara, Western Australia [precise locality withheld for conservation reasons], 22 September 2017, *A.P. Brown & R.W. Davis* APB 4307 (*holo*: PERTH 09033971; *iso*: AD, CANB, MEL).

Eremophila oldfieldii subsp. Karara (D. Coultas s.n. PERTH 07341717), Western Australian Herbarium, in *FloraBase*, https://florabase.dpaw.wa.gov.au/ [accessed October 2018].

Illustration. A.P. Brown & B.J. Buirchell, *A Field Guide to the Eremophilas of W. Austral.*, p. 197 (2011), as *E. oldfieldii* subsp. Karara.

An erect to spreading much branched *shrub* 1.5–3.0 m high, 2–4 m wide. *Branches* grey, terete, tuberculate, young parts with sparse grey-white branched hairs, old parts glabrescent. *Leaves* green to grey-green, sessile, although gradually tapering to a short petiole-like base, alternate, erect or spreading, scattered along branches, oblanceolate, (20–)40–55(–65) mm long, (6–)7–10(–12) mm wide, the upper and lower surfaces glandular-pustulate; apex acute to subobtuse; margins entire. *Flowers* 1 per axil; pedicel terete basally, becoming dilated distally, straight or slightly curved, 10–15 mm long, with scattered, grey-white branched hairs. *Sepals* 5, oblanceolate, attenuate, imbricate towards the base, equal or subequal, 12–18 mm long, 4–8 mm wide, not enlarging after flowering; outer and inner surfaces green, sometimes tinged with brown, with sparse short simple hairs. *Corolla* zygomorphic, 22–30 mm long, 8–10 mm wide; outer and inner surfaces orange-red to brick red, unspotted, glabrous with the exception of scattered simple hairs along the margins of lobes; lowermost lobe dilated, truncate to emarginate; upper 4 lobes acute. *Stamens* 4, exserted; filaments 25–30 mm long, glabrous; anthers glabrous. *Ovary* ovoid, 4-locular with 2 ovules per locule, 3–4 mm long, 2.0–2.5 mm wide, glabrous or with sparse short simple hairs. *Style* 25–30 mm long, glabrous. *Fruit* dry, subglobular, 7–9 mm long, 4–5 mm wide, rugose, glabrous. *Seed* ovoid, 2.2–2.4 mm long, 1–1.2 mm wide. (Figure 1)

Diagnostic features. *Eremophila oldfieldii* subsp. *papula* may be distinguished from other subspecies of *E. oldfieldii* F.Muell. by its glandular-pustulate leaves and the following combination of characters: branches tuberculate; leaves oblanceolate, 40–55 × 7–10 mm.

Other specimens examined. WESTERN AUSTRALIA: [localities withheld for conservation reasons] 16 Nov. 2005, *D. Coultas s.n.* (PERTH); 22 Sep. 2010, *D. Coultas & A. Saligari* DCAS Opp 9 (PERTH); 14 Nov. 2015, *A. Crawford* ADC 2686 (PERTH); 29 Sep. 2010, *K. Greenacre & B. Stratton*, KIOP 145-01 (PERTH).

Phenology. Predominantly flowers from August to November with rare flowering following rainfall at other times of the year. Fruiting throughout the year following flowering.

https://florabase.dpaw.wa.gov.au/nuytsia/
ISSN 2200-2790 (Online)
ISSN 0085-4417 (Print)



Figure 1. *Eremophila oldfieldii* subsp. *papula*. A – flowering plant *in situ* showing a much branched, spreading habit; B – flower, showing the large oblanceolate, attenuate sepals and unspotted, subglabrous corolla; C – leaves, showing the characteristic glandular-pustulate upper and lower surfaces of the lamina. Images from *A.P. Brown* & *R.W.* Davis APB 4307. Photographs by A.P. Brown.

Distribution and habitat. Found over a small geographic range north-east of Perenjori in the Yalgoo bioregion (*sensu* Department of the Environment 2017), growing in red brown clay loam on the lower slopes of rocky hills. Associated species include *Acacia tetragonophylla*, *Eucalyptus loxophleba* subsp. *supralaevis*, *Exocarpos aphyllus*, *Tecticornia pterygosperma* subsp. *pterygosperma* and *Mesembryanthemum nodiflorum*.

Conservation status. Currently listed as Priority One under Conservation Codes for Western Australian Flora (Smith & Jones 2018), under the name *E. oldfieldii* subsp. Karara (D. Coultas s.n. PERTH 07341717). The subspecies is known from rare, scattered populations in an area that may be subject to future mining.

Etymology. From the Latin *papula* (pimple or pustule), in reference to the glandular-pustulate leaves of this subspecies.

Notes. *Eremophila oldfieldii* subsp. *papula* may be distinguished from the other two subspecies by its glandular-pustulate leaves and tuberculate branches. It also differs from subsp. *oldfieldii* in its shorter stature 1.5–3 m high when mature (*cf.* 3–6 m in subsp. *oldfieldii*) and usually shorter, broader leaves 40–55 × 7–10 mm (*cf.* 50–100 × 3–8 mm) and from subsp. *angustifolia* (S.Moore) Chinnock in its broader leaves 7–10 mm wide (*cf.* 1.5–2.5 mm in subsp. *angustifolia*).

Although *Eremophila oldfieldii* subsp. *papula* is found near *E. oldfieldii* subsp. *oldfieldii* and occurs in similar habitat, they are not known to grow together.

Eremophila sericea A.P.Br., *sp. nov.*

Type: Karara, Western Australia [precise locality withheld for conservation reasons], 22 September 2017, *A.P. Brown & R.W. Davis* APB 4308 (*holo*: PERTH 09033963; *iso*: CANB, MEL).

Eremophila sp. Rothsay (D. Coultas & J. Kelt s.n. PERTH 08200440), Western Australian Herbarium, in *FloraBase*, https://florabase.dpaw.wa.gov.au/ [accessed October 2018].

Illustration. A.P. Brown & B.J. Buirchell, *A Field Guide to the Eremophilas of W. Austral.*, p. 316 (2011), as *E.* sp. Rothsay.

A small much branched *shrub*, 0.2–1.2 m high, 0.8–1.6 m wide. *Branches* grey, terete, non-tuberculate, young parts with a dense indumentum of grey-white, branched hairs, old parts glabrescent. *Leaves* grey-white, more rarely grey-green, shortly petiolate, opposite, erect or spreading, scattered along branches; pedicel terete, straight or slightly curved, 2–3 mm long, with crowded, grey-white branched hairs; lamina elliptic, 15–25 mm long, 6–14 mm wide, the upper and lower surfaces with crowded, grey-white branched hairs; apex obtuse to subobtuse, margins entire. *Flowers* 2 per axil. *Sepals* 5, lanceolate, attenuate, imbricate, equal, appressed against the corolla, 5–7 mm long, 1.5–2.0 mm wide, not enlarging after flowering; outer surface grey-white, more rarely grey-green, with a dense indumentum of short, grey-white branched hairs; inner surface grey-green with short, grey-white branched hairs in distal third, more sparsely hairy below except along margins. *Corolla* zygomorphic, 17–22 mm long, 8–10 mm wide, abruptly constricting above ovary; outer surface purple to pale lilac, unspotted, with crowded grey-white branched hairs; inner surface white, with scattered villous-arachnoid hairs extending down from below medial lobe of lower lip; lobes subequal, spreading, obtuse. *Stamens* 4, included; filaments 5–8 mm long, glabrous; anthers glabrous. *Ovary* ovoid-obloid, 4-locular with 1 ovule per locule, 3–5 mm long, 2–4 mm wide, with crowded branched hairs. *Style* 6–8 mm long, glabrous. *Fruit* dry, ovoid-conical, 6–8 mm long, 5–7 mm wide, rugose, with scattered branched hairs when young. *Seed* unknown. (Figure 2)

Diagnostic features. *Eremophila sericea* may be distinguished from all other members of the genus by the following combination of characters: small much branched shrub up to 1.2 m high; branches, leaves and sepals with a dense indumentum of grey-white branched hairs; leaves shortly petiolate, opposite, lamina elliptic; flowers 2 per axil; sepals lanceolate, attenuate, imbricate, equal, appressed against the corolla; corolla purple to pale lilac, unspotted, abruptly constricting above the ovary; outer surface with crowded, grey-white branched hairs; inner surface white with scattered villous-arachnoid hairs extending down from below the medial lobe of lower lip.

Other specimens examined. WESTERN AUSTRALIA: [localities withheld for conservation reasons] 31 Mar. 2015, *J. Borger* PJ 04 (PERTH); 26 Oct. 2009, *D. Coultas & J. Kelt* Opp 1 (PERTH); 16 Nov. 2009, *D. Coultas & J. Kelt s.n.* (PERTH); 15 Sep. 2010, *D. Coultas & K. Greenacre* DCKG Opp 1 (PERTH); 6 Jan. 2016, *A. Crawford* ADC 2727 (PERTH).

Phenology. Predominantly flowers from September to November with rare flowering following rainfall at other times of the year. Fruiting throughout the year following flowering.



Figure 2. *Eremophila sericea*. A – flowering plant *in situ* showing the much branched habit; B – flowering stem, showing the grey-white indumentum on the stems, leaves and sepals, the opposite leaves and the purple to pale lilac, unspotted corolla; C – close up of flower. Images from *A.P. Brown* & *R.W. Davis* APB 4308. Photographs by A.P. Brown.

Distribution and habitat. Found over a small geographic range north-east Perenjori in the Avon Wheatbelt and Yalgoo bioregions (*sensu* Department of the Environment 2017), growing in red brown clay loam on the lower slopes of rocky hills. Associated species include *Acacia andrewsii*, *Eucalyptus loxophleba* subsp. *supralaevis*, *E. salubris*, *Eremophila oldfieldii* subsp. *oldfieldii*, *E. scoparia* and *Senna charlesiana*.

Conservation status. Currently listed as Priority One under Conservation Codes for Western Australian Flora (Smith & Jones 2018), under the name *E.* sp. Rothsay (D. Coultas & J. Kelt s.n. PERTH 08200440). The species is known from several mostly small populations. One population is on a weedy road verge and all others are in an area that may be subject to future mining.

Etymology. From the Latin *sericeus* (silky), in reference to the densely silky-hairy branches, leaves and sepals of this species.

Affinities. *Eremophila sericea* appears closest in morphology to *E. malacoides* Chinnock and like that species is a densely hairy, much branched shrub up to 1.2 m high with opposite, elliptic leaves, lanceolate, attenuate sepals and a tubular, lilac to purple corolla that is constricted just above the ovary. *Eremophila sericea* may be distinguished from *E. malacoides* by its larger leaves, 15–25 × 6–14 mm (*cf.* 5–15 × 2.5–6.0 mm in *E. malacoides*), two flowers per axil (*cf.* one flower per axil) and smaller corolla 17–22 mm long (*cf.* 20–32 mm long).

Notes. *Eremophila sericea* occasionally hybridises with *E. scoparia* (R.Br.) F.Muell., producing offspring that are intermediate in morphology, i.e. *R. Meissner & R. Coppen* 4312. However, the parent species do not appear to be closely related as they differ in their stature, leaf width, sepal length and corolla indumentum.

Eremophila xantholaema R.W.Davis, *sp. nov.*

Type: Bulong, Western Australia [precise locality withheld for conservation reasons], 16 September 2018, *R. Davis & A. Brown* RD 12904 (*holo*: PERTH 08171033; *iso*: CANB, MEL).

Eremophila sp. Kalgoorlie (V. Clarke & A. Brown VTC 590), Western Australian Herbarium, in *FloraBase*, https://florabase.dpaw.wa.gov.au/ [accessed October 2018].

Illustration. A.P. Brown & B.J. Buirchell, *A Field Guide to the Eremophilas of W. Austral.*, p. 298 (2011), as *E.* sp. Kalgoorlie.

Erect *shrub* to 1.2–3.0 m high, 0.9–1.3 m wide. *Branches* grey, compressed to terete, with a dense indumentum of short, appressed, flattened hairs. *Leaves* grey-green, opposite to sub-opposite; lamina linear, 25–40 mm long, 1.5–2.0 mm wide, terete to sub-terete and channelled, with crowded, appressed, flattened hairs intermixed with scattered, short glandular hairs; apex uncinate; margins entire. *Flowers* 1 per axil; pedicel straight or slightly curved, 2–3 mm long; with appressed, flattened hairs. *Sepals* 5, separated at base, sub-equal, spathulate to oblanceolate, 5–6 mm long, 1.2–2.5 mm wide, not enlarging after flowering (splaying slightly towards the apex in fruit); outer and inner surfaces mauve to pale pink, with crowded, flattened, appressed hairs, intermixed with scattered glandular hairs. *Corolla* zygomorphic, 9–12 mm long, 6.0–7.5 mm wide, outer surface pale pink and mauve, more rarely pale yellow and mauve, glabrous, inner surface below the lobes predominantly yellow with darker brown or orange markings, with densely tangled hairs in the throat; lobes mauve to pale pink, subequal,

spreading, obtuse with sparse, short hairs. *Stamens* 4, included; filaments 4.5–5.5 mm long, with crowded, simple hairs on the lower half; anthers glabrous. *Ovary* ovoid, 4-locular with one ovule per locule, 1.3–1.5 mm long, 0.8–0.9 mm wide, with crowded simple hairs. *Style* 6–6.5 mm long, with scattered, long, simple hairs on the lower two thirds. *Fruit* dry, ovoid, 2.8–3.0 mm long, 1.5–1.7 mm wide, with crowded, simple hairs. *Seed* unknown. (Figure 3)

Diagnostic features. *Eremophila xantholaema* may be distinguished from all other members of the genus by the following combination of characters: tall erect shrub up to 3 m high; sepals oblanceolate, free or fused only at the base; vegetative parts clothed in a fine pubescence of flattened, appressed hairs; corolla mauve to pale pink, 9–12 mm long, the inner surface below the lobes predominantly yellow with brown or orange markings.

Other specimens examined. WESTERN AUSTRALIA: [localities withheld for conservation reasons] 16 Oct. 2005, *V. Clarke & A. Brown* VTC 590 (PERTH); 16 Oct. 2005, *M.J. Grieve & J.D. Start* D7 122 (PERTH).

Phenology. Predominantly flowers from September to October with rare flowering following rainfall at other times of the year. Fruiting throughout the year following flowering.

Distribution and habitat. Found near Bulong in the Coolgardie Bioregion (*sensu* Department of the Environment 2017), growing in stony, brown loam soils in *Eucalyptus-Casuarina* woodland on the upper slopes of low rocky hills. Associated species include *Casuarina pauper*, *Eremophila glabra* subsp. *glabra*, *E. parvifolia* subsp. *auricampa*, *E. pustulata*, *Senna artemisioides* subsp. *filifolia* and *Westringia rigida*.



Figure 3. *Eremophila xantholaema*. A – plant *in situ* showing the erect habit; B – leaves and flowers showing the terete or sub-terete grey-green leaves and flowers with sub-equal sepals and glabrous corolla with markings in the throat. Images from *R.W. Davis & A.P. Brown* RD 12904 (A) and *V. Clarke & A. Brown* VTC 590 (B). Photographs by A.P. Brown.

Conservation status. Currently listed as Priority One under Conservation Codes for Western Australian Flora (Smith & Jones 2018) under the name *E.* sp. Kalgoorlie (V. Clarke & A. Brown VTC 590). The species is known from just three populations near Bulong.

Etymology. The epithet is from the Greek *xantho-* (yellow-) and *laimos* (throat), in reference to the inner surface of the corolla which is predominantly yellow with brown or orange markings.

Affinities. *Eremophila xantholaema* appears closest in morphology to *E. oppositifolia* R.Br. subsp. *angustifolia* (S.Moore) Chinnock and co-occurs with that taxon east of Kalgoorlie. *Eremophila xantholaema* may be distinguished from *E. oppositifolia* subsp. *angustifolia* by its usually shorter, sub-opposite leaves 25–40 mm long (*cf.* 29–120 mm long and opposite in *E. oppositifolia* subsp. *angustifolia*), shorter corolla 9–12 mm long (*cf.* 15–30 mm long) and the prominent yellow mottled markings in the throat of the corolla (*cf.* no markings).

Notes. *Eremophila xantholaema* was first recognised as distinct in October 2005, when plants were found near Bulong. The species has since been surveyed for over a wide area, with just two additional populations found, both within 10 km of the type location.

Acknowledgements

We would like to thank David Coultas and Greg Woodman who were the first to collect *Eremophila oldfieldii* subsp. *papula* and *E. sericea* and recognise them as distinct. We also thank Bevan Buirchell, Phil and Marlene James, and Joff and Joan Start who have often accompanied us in the field and who have made valuable comments during discussions about these taxa. In addition, we thank Melanie Smith and Anthea Jones for assessing the conservation status of these taxa, the Curator and staff at the Western Australian Herbarium for access to specimens and Barbara Rye for useful comments and edits on the manuscript.

References

Department of the Environment (2017). *Australia's bioregions (IBRA)*, IBRA7, Commonwealth of Australia. https://www.environment.gov.au/land/nrs/science/ibra#ibra [accessed 2 July 2018].

Smith, M.G. & Jones, A. (2018). *Threatened and Priority Flora list 5 December 2018*. Department of Biodiversity, Conservation and Attractions. https://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-plants [accessed 7 March 2019].

Andrew P. Brown[1,3] and Robert W. Davis[1]

[1]Western Australian Herbarium, Biodiversity and Conservation Science,
Department of Biodiversity, Conservation and Attractions,
Locked Bag 104, Bentley Delivery Centre, Western Australia 6983
[3]Corresponding author, email: andrewbrown3@optusnet.com.au